

WEST INDIAN COCCINELLIDAE II (COLEOPTERA):
SOME SCALE PREDATORS WITH KEYS
TO GENERA AND SPECIES

ROBERT D. GORDON

Systematic Entomology Laboratory, IIBIII,
Sci. and Educ. Admin., USDA¹

ABSTRACT

Several West Indian species of Coccinellidae, mostly scale predators, are described or discussed with host data recorded. Five tribes are represented in this material and dealt with as follows. Microweisini; key to species of *Coccidophilus*, *Coccidophilus cariba*, n. sp., described. Scymnillini; key to genera, *Viridigloba imitator*, new genus and species described, key to species of *Zagloba*, *Scymnus* (*Nephus*) *aeneipennis* Sicard transferred to *Zagloba*. Scymnini; key to genera, key to species of *Nephaspis*, *Nephaspis nigra*, n. sp., described. Cryptognathini; *Delphastopsis amazonica* Casey transferred to *Calloeneis*, *Calloeneis bennetti*, n. sp., described. Orталиini; new color form of *Zenoria emarginata* Gordon placed in key.

Among specimens recently received from F. D. Bennett of the Commonwealth Institute of Biological Control, Curepe, Trinidad, were some undescribed or rarely collected predators belonging to the beetle family Coccinellidae. The purposes of this paper are to describe the new species, provide keys for identification of genera and species, and record host data. The 5 tribes involved are Microweisini, Scymnillini, Scymnini, Cryptognathini, and Orталиini.

Types and other specimens are in the collections of the British Museum (Natural History), F. D. Bennett, and the U. S. National Museum (USNM). In this paper I provide descriptions and names for those species representing tribes or genera in which I have previously done some research. Keys to genera and species are provided in cases where classification has reached a stage where the keys have some significance. References to reviews or revisions of genera, tribes or subfamilies are included and are listed in the discussion of the appropriate taxon.

TRIBE MICROWEISINI

This tribe is a member of the subfamily Sukunahikoninae, recently revised for the Western Hemisphere (Gordon 1977). The only known West Indian member of the genus *Coccidophilus* is described, and a key to all described species is presented.

¹Mail address: c/o U. S. National Museum, Washington, D. C. 20560.

Key to species of *Coccidophilus*

1. Punctures on elytron coarse, dense, 2 or 3 times as large as pronotal punctures; Baja California *C. peninsularis* (Gordon)
- 1'. Punctures on elytron fine, sparse, not obviously larger than pronotal punctures; not known from Baja California 2
- 2(1'). Head and pronotum distinctly paler in color than elytron; West Indies *C. cariba*, n. sp.
- 2'. Head and pronotum not paler than elytron; not known from the West Indies 3
- 3(2'). Anterolateral line on pronotum not joining lateral margin, visible to posterior margin; western United States.....
..... *C. atronitens* (Casey)
- 3'. Anterolateral line on pronotum joining lateral margin, not visible to posterior margin 4
- 4(3'). Anterior portion of head short, less than length of eye from antennal insertion to apex; North America .. *C. marginatus* (LeConte)
- 4'. Anterior portion of head long, more than length of eye from antennal insertion to apex; South America *C. citricola* Brèthes

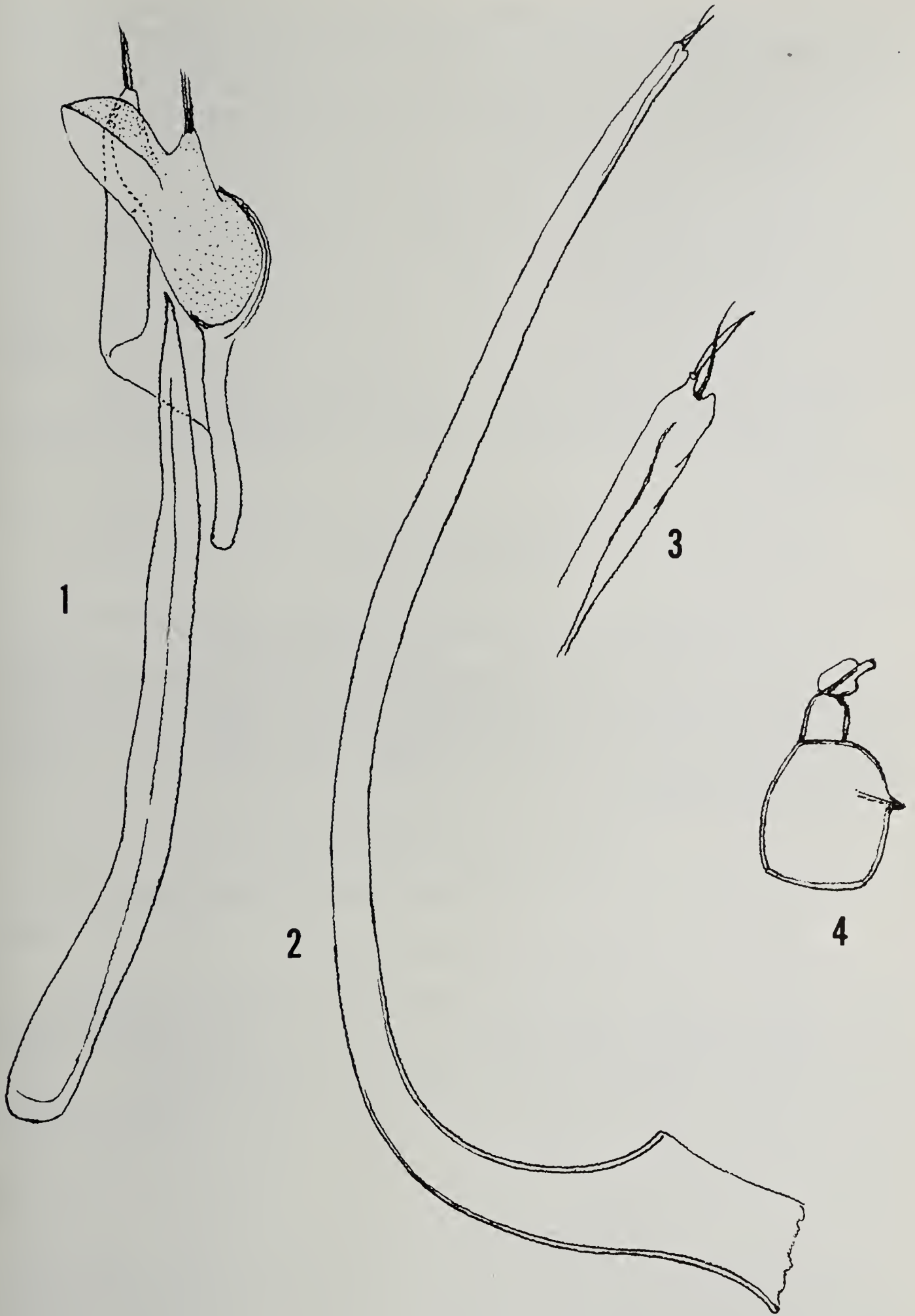
Coccidophilus cariba Gordon, new species

Holotype.—Male, length 1.0 mm, greatest width 0.68 mm. Form oval, convex, widest at middle of elytra. Color brownish piceous except pronotum, head, lateral border of elytron and mouth parts paler reddish brown. Head shiny, feebly alutaceous, finely punctured, punctures separated by less than to twice a diameter. Pronotum smooth, shiny, finely punctured, punctures separated by less than to 3 times a diameter; anterolateral line widely separated from anterolateral angle; lateral margin slightly flared. Elytron smooth, shiny, punctures slightly coarser than on pronotum, separated by less than to twice a diameter. Ventral surface smooth, polished, with some sparse pubescence becoming denser on last 2 abdominal sterna. Postcoxal line divided, outer portion very short, strongly curved, inner line long, complete, extending nearly to hind margin of first sternum, then outward to lateral margin. Genitalia as in figs. 1-3.

Allotype.—Female, similar to male in all respects except sexual characters. Genitalia with spermathecal capsule as in fig. 4.

Variation.—Length ranges from 0.85 to 1.10 mm, width from 0.60 to 0.71 mm. Many specimens have the pale reddish-brown elytral border much more apparent than described for the holotype. In these specimens the pronotum, head and ventral surface are also paler in color than in the holotype.

Type-material.—Holotype, West Indies, Antigua, March, 1976, with scales on coconut (USNM 75461). Allotype and 8 paratypes, same data as holotype (USNM). Five paratypes, Antigua, IX-1961, F. D. Bennett, predaceous on *Pseudaulacaspis pentagona*; 1 paratype, Antigua, III-1962, F. D. Bennett, on cotton; 4 paratypes, Antigua, III-1962, F. D. Bennett, on scale on *Cocos*; 4 paratypes, Antigua, 24-XI-1972, F. D. Bennett, assoc. with scales and whitefly on coconut; 1 paratype, Curacao, V-1964, F. D. Bennett, with *Aspidiotus destructor* on *Cocos*; 1 paratype, Curacao, V-1964, F. D. Bennett, with *Aspidiotus destructor* Signoret on *Cocos*; Dominica, Girandel, III-1965, F. D. Bennett, on coffee; 12 paratypes, Montserrat, 18-3, 25-3, Hubbard; 1 paratype, Montserrat, Sept. 20, 1934, R. G. Fennah; on scale; 3 paratypes, Montserrat, 20-IX-39, R. G. Fennah, on white scale; 3 paratypes, Montserrat, II-1964, F. D. Bennett; 4 paratypes, Montserrat, V-1974, F. D. Bennett, *Aspidiotus destructor* on coconut; 1 paratype, St. Kitts, 7-7-04, H. A. Ballou; 2 paratypes, St. Kitts, 28-IX-1909, H. A. Ballou, on purple stem cotton infested with *Chionaspis minor* and *Lecanium oleae*; 11 paratypes, St. Kitts, IX-10-43, R. G. Fennah, feeding on *Aspidiotus*; 4 paratypes, St. Kitts, VI-1966, on *A. destructor* on *Cocos*; 1 paratype, St. Kitts, XI-1972



Figs. 1-4. *Coccidophilus cariba*, genitalia. Fig. 1, male phallobase, lateral view; figs. 2 and 3, male siphon, entire and apex enlarged; fig. 4, female spermathecal capsule.

F. D. Bennett, predaceous on *Aspidiotus destructor* on breadfruit; 5 paratypes, Nevis, V-1972, F. D. Bennett, predaceous on *Aspidiotus destructor* on coconut. (USNM) (BMNH) (F. D. Bennett).

There are 4 previously described species of *Coccidophilus*, and *cariba* usually may be readily separated from these by the characters used in the key. In addition, most specimens of *C. cariba* have a distinct, broad, yellowish-red border just inside the lateral margin of the elytron which is unique to this species. *C. cariba* is the only member of *Coccidophilus* thus far known from the West Indies, but this is probably an artifact of collecting rather than fact. The scale, *Aspidiotus destructor* Signoret, is the most commonly recorded host for this species. In addition, *Pseudaulacaspis pentagona* (Targioni-Tozzetti) and *Saissetia "oleae"* (Olivier) or *Chionaspis minor* Maskell are implicated as hosts. Other members of this tribe are all scale feeders, mostly on members of the Diaspididae, and are not known to be host specific; apparently *C. cariba* is not host specific either.

The specific name is a noun in apposition, and refers to the Caribbean distribution.

TRIBE SCYMNILLINI

This tribe belongs to the subfamily Scymninae and is composed of 2 previously described genera and a new genus described herein, all apparently restricted to the Western Hemisphere. Host data for members of the Scymnillini are meagre, but indicate that they are obligate scale feeders. The hirsute members of the Scymnillini are often mistaken for Scymnini, but members of the Scymnini have 6 visible abdominal sterna as opposed to 5 in the Scymnillini.

Key to genera of Scymnillini

1. Dorsal surface smooth, pubescence lacking or not evident.....
.....*Scymnillus* Horn
- 1'. Dorsal surface strongly pubescent 2
- 2(1'). Elytral epipleuron broad, slightly descending externally;
apex of clypeus nearly truncate *Viridigloba*, n. gen.
- 2'. Elytral epipleuron narrow, grooved, not descending ex-
ternally; apex of clypeus with lateral angle oblique.....
..... *Zagloba* Casey

Genus *Scymnillus* Horn

Scymnillus has not been taxonomically treated as a whole, and there are many undescribed species represented in various collections. *Scymnillus badius* Weise should be mentioned here because F. D. Bennett has labeled 2 specimens as feeding on *Aspidiotus destructor* Signoret on coconut. This species was described from Trinidad (Weise 1929), but the types have apparently been lost. The specimens I am considering to be *S. badius* are from Nevis, West Indies, but fit the original description of the Trinidad specimens perfectly.

Genus *Zagloba* Casey

Gordon (1970) treated the 2 species known to occur in Central and South America. Since then, the types of *Scymnus* (*Nephus*) *aeneipennis* Sicard have been examined, making it necessary to assign that species to *Zagloba*.

Key to Neotropical species of *Zagloba*

1. Elytron dark metallic green; pronotum reddish yellow except small, piceous area anterior to scutellum.....
..... *Z. aeneipennis* (Sicard), n. comb.
- 1'. Elytron never metallic green; pronotum variously colored 2
- 2(1'). Elytron with an obscure, narrow, pale spot extending from humeral callus diagonally to apex of elytron at sutural angle; first abdominal sternum with lateral setigerous punctures round, not or only occasionally contiguous.....
..... *Z. beaumonti* Casey
- 2'. Elytron dark brown to piceous, always unicolorous; first abdominal sternum with lateral setigerous punctures elongate, contiguous..... *Z. obscura* Gordon

Zagloba aeneipennis (Sicard), **new combination**

Scymnus (*Nephus*) *aeneipennis* Sicard, 1929, p. 521.

A specimen of the type series in the British Museum (Natural History) labeled "Brit. West Indies, Trinidad, 1927-28, F. N. C. Taylor/predaceous on *Aspidiotus destructor*" is here selected as the lectotype and so labeled. Three other types with identical labels in the Museum d'Histoire Naturelle, Paris, are designated and labeled paralectotypes.

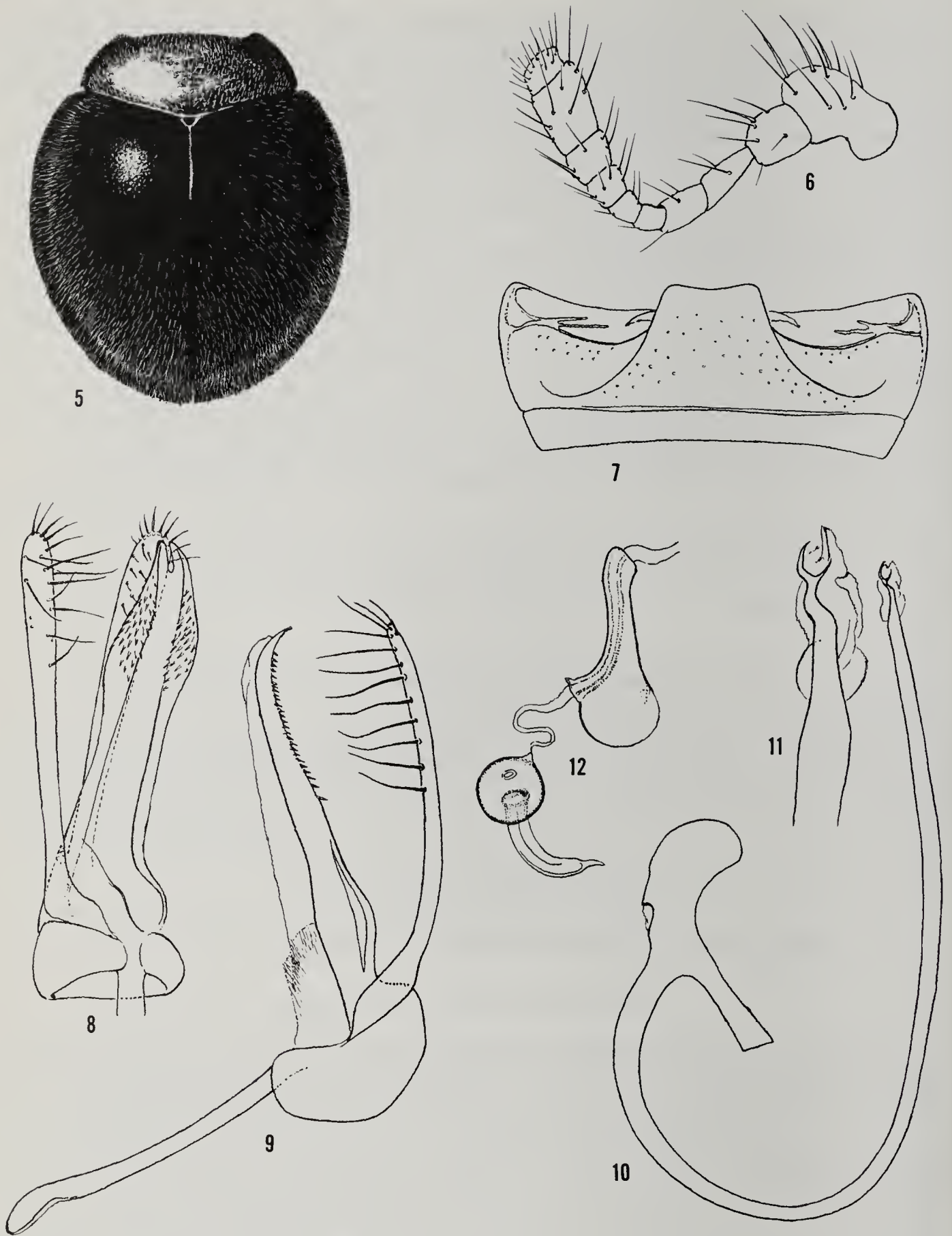
The only known hosts for *Z. aeneipennis* are the scales, *Aspidiotus destructor* Signoret and *Parlagena bennetti* Williams.

Viridigloba Gordon, **new genus**

Form broad, oval (Fig. 5). Head covered with short, decumbent pubescence, deeply inserted in pronotum, eye partially concealed; anterior margin of clypeus nearly truncate, feebly emarginate, lateral angle abrupt; genal lobe extending onto anterior 1/3 of eye; antennal scape 7-segmented, club 3-segmented (fig. 6); apical segment of maxillary palpus not securiform, sides nearly parallel, narrowed slightly at apex. Pronotum broad, deeply emarginate anteriorly, covered with decumbent pubescence, base margined, anterior angle produced, extending downward beyond lower margin of eye. Elytron covered with decumbent pubescence, lateral margin distinctly flared; epipleuron broad, nearly flat, descending somewhat externally. Prosternum with intercoxal process broad, flat, apical margin truncate. Mesosternum with intercoxal process broad, coxae widely separated. Legs slender; femur with slight emargination for reception of tibia; tibia nearly parallel sided, not emarginate for reception of tarsus; tarsus cryptotetramerous, tarsal claws without basal tooth. Abdomen with 5 visible sterna; postcoxal line incomplete, not reaching hind margin of first sternum, apex slightly recurved (fig. 7). Female spermathecal capsule with base globose, apical half slender, curved, with falciform appendage at apex (fig. 12); sperm duct short; infundibulum large, heavily sclerotized. Male genitalia symmetrical; basal lobe with short, stout asperities in apical half (fig. 8).

Type-species: *Viridigloba imitator*, new species.

Viridigloba is superficially very similar to *Zagloba*. The principal morphological differences between the 2 genera are: the form of the female sper-



Figs. 5-12. *Viridigloba imitator*. Fig. 5, habitus; fig. 6, antenna; fig. 7, post-coxal lines on first abdominal sternum; figs. 8 and 9, male phallobase, ventral and lateral views; figs. 10 and 11, male siphus, entire and apex enlarged; fig. 12, female spermathecal capsule and infundibulum.

mathecal capsule, which is curved normally and narrowed from base to apex in *Zagloba*, composed of a round basal portion and curved neck (fig. 12) in *Viridigloba*; clypeal apex, which is slightly reflexed anteriorly and has the lateral angles oblique in *Zagloba*, not reflexed and nearly rectangular in *Viridigloba*; claws, toothed basally in *Zagloba*, not toothed in *Viridigloba*.

The name *Viridigloba* refers to the green color and round form of the type-species.

Viridigloba imitator Gordon, **new species**

Holotype.—Male, length 2.30 mm, greatest width 1.90 mm. Elytral color dark metallic green; head, pronotum, mouthparts, prosternum and legs reddish yellow; ventral surface piceous. Head finely punctured, punctures separated by a diameter or less. Pronotum with punctures coarser than on head, separated by less than a diameter. Elytral punctation coarser than on pronotum, punctures separated by the diameter of a puncture. Mesosternum densely, coarsely punctured; metasternum with coarse punctures separated by more than a diameter. Abdominal sterna with punctures finer than on metasternum, separated by less than a diameter; 5th sternum strongly emarginate apically. Genitalia with trabes shorter than basal lobe, apex of basal lobe bifid, paramere slightly shorter than basal lobe (figs. 8, 9); siphon as in figs. 10, 11.

Allotype.—Female, length 2.15 mm, greatest width 1.75 mm. Similar to holotype except apex of 5th abdominal sternum entire. Female genitalia as in fig. 12.

Variation.—Length ranges from 2.0 to 2.30 mm, width from 1.75 to 1.90 mm.

Type-material.—Holotype, West Indies, Trinidad, Port-of-Spain, Dept. Agr. grounds, Nov. 3, 1918, A-933, Harold Morrison (USNM 75462). Allotype and 3 paratypes, West Indies, Trinidad, V-25-1939, R. G. Fennah, coll. #T2. One paratype, Trinidad, May 1976, on coconut; 1 paratype, Trinidad, Arima Valley, 16-X-69, E. J. Rankin, on coffee; 3 paratypes, Trinidad, Icacos, February, 1947, collector F. J. Simmonds; 2 paratypes, Trinidad, Mayaro, July 1977, on coconut; 2 paratypes, Trinidad, Port-of-Spain, K. A. Bartlett, I-1-'39, P. R. #2236, on *Asterolecanium* spp.; 1 paratype, Trinidad, St. Augustine, Feb. 1947, collector F. J. Simmonds. (USNM) (F. D. Bennett).

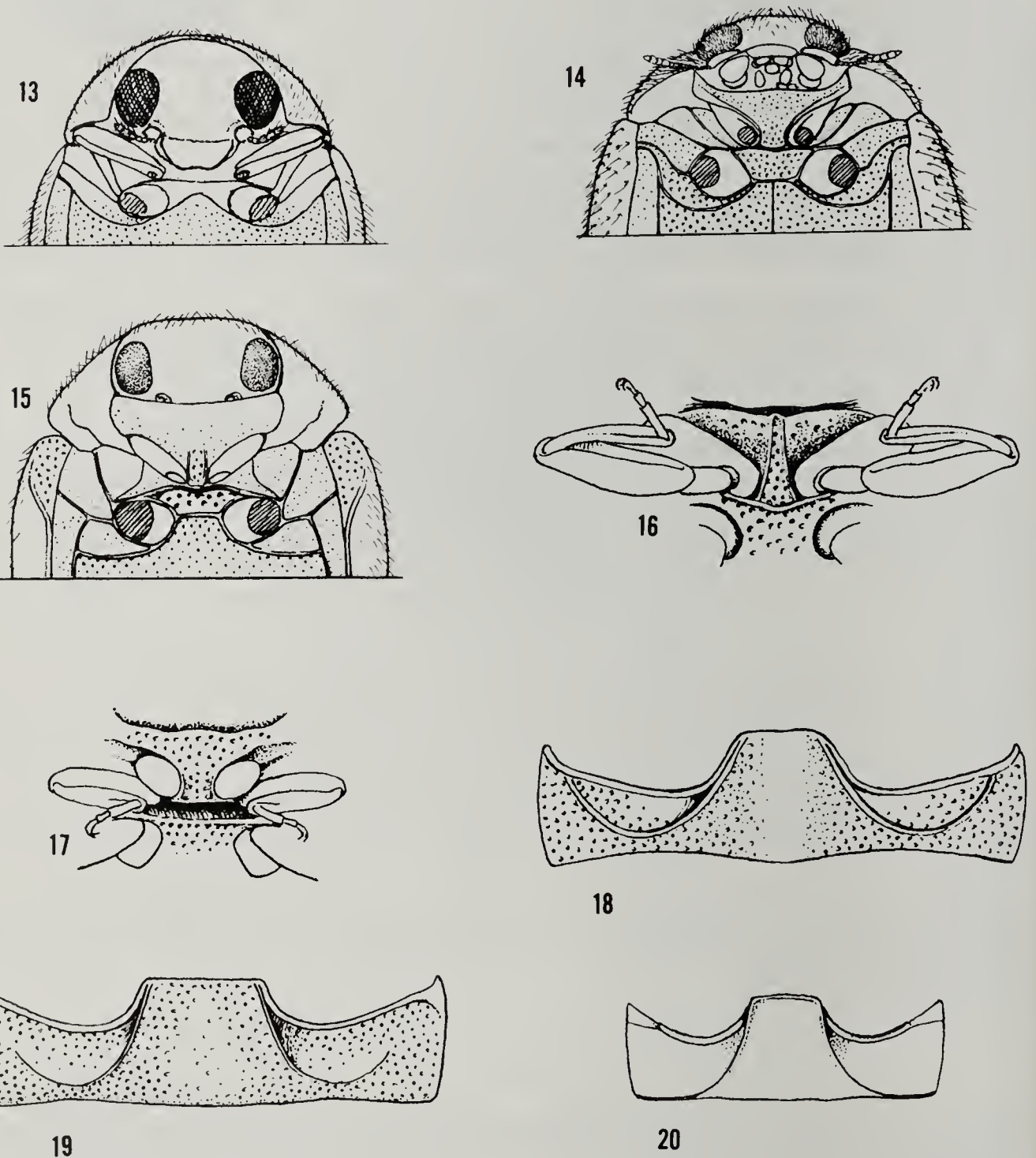
There is a curious similarity between *V. imitator* and *Zagloba aeneipennis*, hence the name *V. imitator*. The color pattern is nearly identical in the 2 species, especially the dark metallic green elytron which is somewhat unusual in the family Coccinellidae. The species may occur together as shown by 5 specimens of *Z. aeneipennis* bearing the same data as the paratypes of *V. imitator* labeled "Trinidad, V-25-1939, R. G. Fennah, coll. #T2".

The only host data available is the label "on *Asterolecanium* spp.". We may presume that *imitator* is a scale predator, but no other information is presently available.

TRIBE SCYMNINI

The key presented here contains all of the scymnine genera presently known to occur in the West Indies. For detailed diagnoses, see Chapin 1933 (*Decadiomus*); Gordon 1972 (*Nephaspis*); Gordon 1976 (*Scymnini*, *Scymnus*, *Diomus*); Gordon and Anderson 1978, in press (*Stethorus*). One new species of *Nephaspis* occurring in Trinidad is described and a revised key constructed to species of that genus.

Cryptolaemus has previously been reported from the West Indies, and there are specimens in the USNM collection taken from Puerto Rico. I do not know if it is presently established, but have included the genus in the key. The only species involved is *C. montrouzieri* Mulsant which has been introduced in various parts of the world as a biocontrol agent. Members of this genus are native to the Australian and Oriental Regions.



Figs. 13-20. Fig. 13, *Nephaspis* sp., prosternum and mouthparts; fig. 14, *Stethorus* sp., prosternum; fig. 15, *Cryptolaemus montrouzieri*, prosternum; fig. 16, *Scymnus* sp., prosternum; fig. 17, *Nephus* sp., prosternum; figs. 18 and 19, postcoxal lines of *Scymnus (Pullus)* sp. and *Scymnus (Scymnus)* sp.; fig. 20, postcoxal lines of *Diomus* sp.

Key to genera of West Indian Scymnini

1. Head with mouthparts directed postero-ventrad in repose, concealing prosternum; basal antennal segment strongly enlarged (fig. 13)..... *Nephaspis* Casey
- 1'. Head with mouthparts not concealing prosternum; basal antennal segment not strongly enlarged 2
- 2(1'). Prosternum enlarged, expanded, capable of concealing mouthparts in repose (figs. 14, 15) 3
- 2'. Prosternum not enlarged, not concealing mouthparts..... 4
- 3(2). Length more than 3.00 mm; pronotum reddish yellow.....
..... *Cryptolaemus* Mulsant
- 3'. Length less than 2.00 mm; pronotum black *Stethorus* Weise
- 4(2'). Prosternum with distinct carinae on intercoxal projection, carinae usually reaching anterior margin of prosternum (fig. 16)..... 5
- 4'. Prosternum without carinae, or at most with short ridges next to coxal cavities (fig. 17)..... *Nephus* (*Scymnobioides*) Casey
- 5(4). Postcoxal line complete or incomplete, usually not joining hind margin of first abdominal sternum, apex recurved (figs. 18, 19)..... *Scymnus* Kugelann
- 5'. Postcoxal line extending downward, joining hind margin of first abdominal sternum (fig. 20), apex not recurved 6
- 6(5'). Tarsus 4-segmented..... *Decadiomus* Chapin
- 6'. Tarsus 3-segmented..... *Diomus* Mulsant

Nephaspis nigra Gordon, **new species**

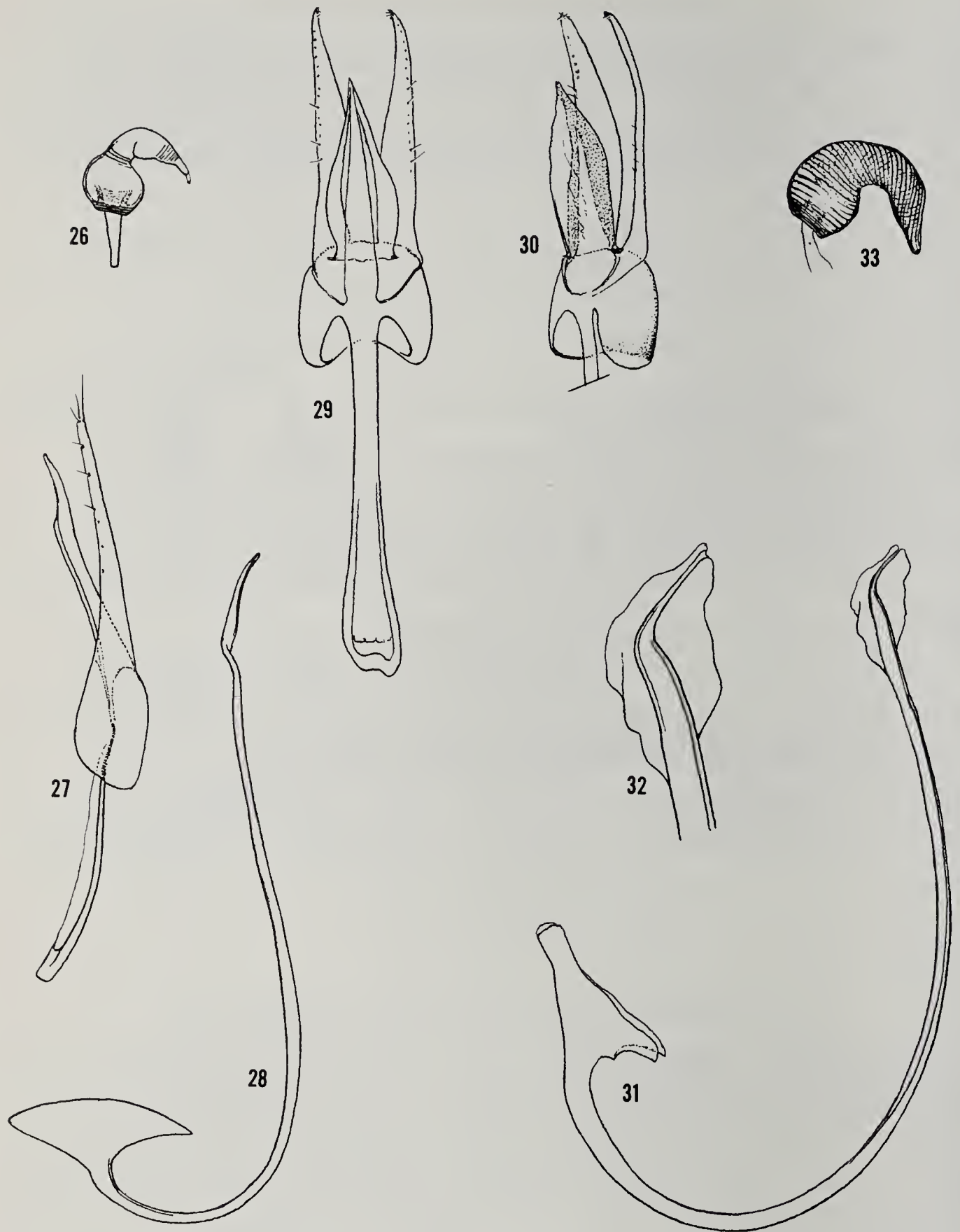
Holotype.—Male, length 1.36 mm, greatest width 0.95 mm. Color black; head, pronotum, mouthparts and legs pale yellow. Head finely punctured, punctures separated by 3 or 4 times a diameter. Pronotal punctures coarser than on head, separated by less than to twice a diameter. Elytron coarsely punctured, punctures separated by the diameter of a puncture. Ventral surface coarsely punctured, punctures sparse medially, nearly contiguous laterally. Genitalia with basal lobe 1/4 longer than paramere, slender in lateral view, broad nearly to apex in ventral view (fig. 21); siphon as in figs. 22, 23.

Allotype.—Female, similar to male except pronotum and vertex of head black. Genitalia as in fig. 24.

Variation.—None observed other than sexual dimorphism.

Type-material.—Holotype, allotype and 1 paratype, Trinidad, Mayaro, June 16, 1977, R. M. Baranowski and F. D. Bennett collectors, on coconut; 6 paratypes, same data except date July 1977. (USNM 75463) (F. D. Bennett).

The male genitalia are the only certain criteria for identifying *N. nigra* as is true of the other members of the genus. Therefore the key to species is based entirely on male genitalia. The key used here is modified from Gordon (1972). Members of this genus normally feed on whiteflies (Aleyrodidae), and I presume *N. nigra* does also. The specific epithet refers to the black color of this species.



Figs. 21-25. *Nephaspis* genitalia. Figs. 21-24, *N. nigra*: fig. 21, male phallobase, dorsal view; figs. 22 and 23, male siphon, entire and enlarged apex; fig. 24, female spermathecal capsule. Fig. 25, *N. amnicola*: male phallobase, ventral view.

Key to males of *Nephaspis*

1. Male genitalia with apex of basal lobe abruptly narrowed to blunt apex in ventral view (fig. 21) *N. nigra*, n. sp.
- 1'. Male genitalia with apex of basal lobe gradually tapered to sharp apex (fig. 25) 2
- 2(1'). Male genitalia with basal lobe wide in lateral view, about 1/2 as wide as long, siphon with apex blunt; known only from British Guiana *N. dispar* (Sicard)
- 2'. Male genitalia with basal lobe less than 1/2 as long as wide, siphon more or less pointed 3
- 3(2'). Male genitalia with basal lobe widest near base in lateral view, tapering evenly to apical point; known only from Pernambuco, Brazil *N. cocois* Gordon
- 3'. Male genitalia with basal lobe not tapering evenly to apex; not known from Brazil 4
- 4(3'). Male genitalia with upper margin straight to apex in lateral view, lower margin slightly emarginate before apex, siphon straight before apex; known only from Panama *N. gorhami* Casey
- 4'. Male genitalia with upper margin feebly sinuate in lateral view, lower margin curved to pointed apex in apical 1/2, siphon bent downward before apex; West Indies, Central America, Iowa, Florida *N. amnicola* Wingo

TRIBE CRYPTOGNATHINI

This tribe is a member of the subfamily Scymninae and was reviewed at the generic level by Gordon (1971b). The generic name *Calloeneis* Grote was provided to replace the preoccupied *Oeneis* Mulsant but has been overlooked by all subsequent authors including Gordon (1971b) (see pp. 184, 185 for detailed discussion). *Calloeneis* was rediscovered by J. Belicek (1976).

I here illustrate the genitalia of *Calloeneis amazonica* (Casey), n. comb., and describe *Calloeneis bennetti*, new species. Three species have previously been described that belong in this genus, *C. obscura* (Mulsant), n. comb., *C. nigrans* (Mulsant), n. comb., and *C. amazonica* (Casey). Because I am aware of many undescribed neotropical species, no key to species is provided.

Calloeneis amazonica (Casey), new combination

Delphastopsis amazonica Casey, 1924, p. 170.—Gordon, 1971b, p. 184.

The holotype of *C. amazonica* is a female which I have compared with a series of specimens collected at Curepe, Trinidad. Externally there are no apparent differences between *C. amazonica* and the Trinidad specimens, and the female spermathecal capsules (fig. 26) are also nearly identical. I regard the specimens from Trinidad as conspecific with the type of *C. amazonica*, and the male genitalia of that species are illustrated in figs. 27, 28. The male differs from the female also in having the lateral 1/3 of the pronotum pale yellow. The female pronotum is entirely dark brown.

Host data for members of *Calloeneis* have been entirely lacking, but the Trinidad specimens bear the label "Pred. on diaspine scale on *Pentacarpa*." It is probable that all members of the Cryptognathini are scale predators and may be mostly restricted to feeding on members of the Diaspididae (armored scales).

Calloeneis bennetti Gordon, **new species**

Holotype.—Male, length 1.73 mm, greatest width 1.50 mm. Form rounded, slightly oval, convex. Color black except mouthparts, hypopleuron, legs and abdomen reddish brown. Head dull, surface strongly alutaceous, finely punctured, punctures separated by less than to twice a diameter; gena produced laterally onto eye, broad, dividing inner 1/3 of eye. Pronotum smooth, shiny, densely punctured, punctures separated by a diameter or less. Elytron smooth, shiny, punctures dense, slightly larger than on pronotum, separated by a diameter or less. Ventral surface with pro- and mesosterna dull, densely punctured; metasternum smooth, shiny, punctures fine, separated by 2 to 3 times a diameter; epipleuron grooved medially; abdominal sterna dull, strongly alutaceous, indistinctly punctured. Genitalia as in figs. 29-32.

Allotype.—Female, similar to male in all respects. Spermathecal capsule as in fig. 33.

Type-material.—Holotype, allotype and 2 paratypes, West Indies, Trinidad, Mayaro, 4-III, 1976, F. D. Bennett, pred. on *Aspidiotus destructor* Signoret on coconut (USNM 75464); 2 paratypes, Trinidad, May 1976, on coconut. (F. D. Bennett).

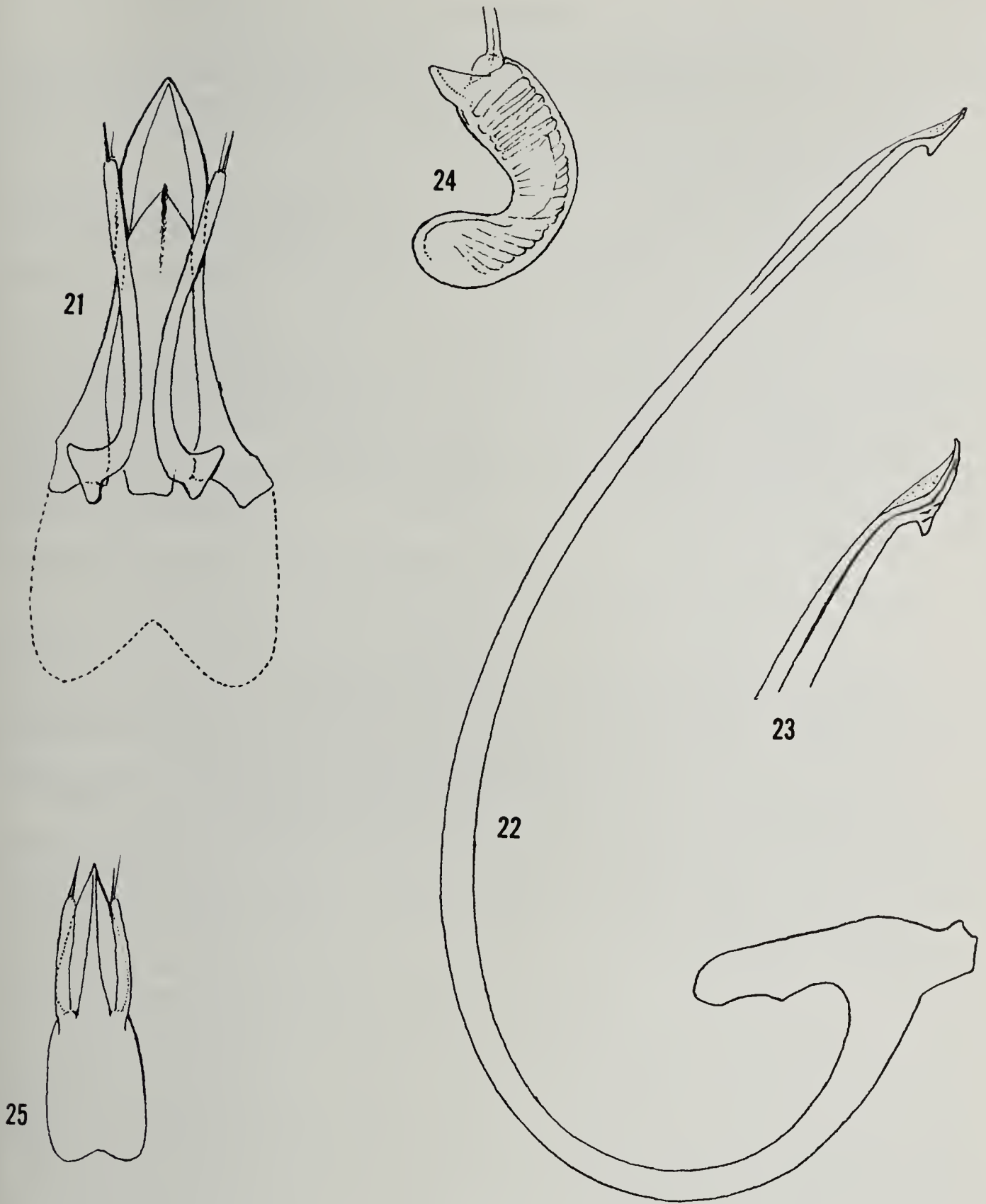
The solid black color of this species is shared with only one described species, *C. nigrans* (Mulsant), from Brazil; however, *C. nigrans* is a small species, less than 1.25 mm long. As recorded for *C. amazonica*, a diaspidid scale is implicated as the host of *C. bennetti*, in this case *Aspidiotus destructor* Signoret.

The species is named for F. D. Bennett in recognition of his interest in Coccinellidae in the field of biological control.

TRIBE ORTALIINI

This tribe is also in the subfamily Scymninae and contains some of the most rarely collected Coccinellids in the Western Hemisphere. Among the coccinellids collected by Bennett at Mayaro, Trinidad, was a series of *Zenoria emarginata* Gordon. This species was originally described (Gordon 1971a) from specimens collected in Trinidad preying on *Aspidiotus destructor* Signoret. The color pattern of Bennett's specimens represents a variation not seen when *Z. emarginata* was described, thus these specimens will not go to *Z. emarginata* in the key to species (Gordon 1971a). Rather, they key to *Zenoria discoidalis* (Kirsch), a species known from Peru and Bolivia. The following modification of the key will allow this color form to be recognized.

- 14. Discal elytral spot large, leaving only a narrow yellow ring around lateral border of elytra; Trinidad *Z. emarginata* Gordon
- 14'. Discal elytral spot small, leaving 1/3 or more of each elytron yellow; not known from Trinidad 15
- 15. Discal elytral spot black; male genitalia with basal lobe as long as paramere, a small tooth at apex of paramere; Peru, Bolivia *Z. discoidalis* (Kirsch)
- 15'. Discal elytral spot usually metallic green; male genitalia with basal lobe shorter than paramere, paramere with a tooth on inner margin before apex; Brazil *Z. crotchi* Gordon



Figs. 26-33. *Calloeneis* genitalia. Figs. 26-28, *C. amazonica*: fig. 26, female spermathecal capsule; figs. 27 and 28, *C. amazonica*, male phallobase (lateral view) and entire siphon. Figs. 29-33, *C. bennetti*: figs. 29 and 30, male phallobase, ventral and lateral views; figs. 31 and 32, male siphon, entire and enlarged apex; fig. 33, female spermathecal capsule.

REFERENCES

- BELICEK, J. 1976. Coccinellidae of Western Canada and Alaska with analyses of the transmontane zoogeographic relationships between the fauna of British Columbia and Alberta (Insects: Coleoptera: Coccinellidae). *Quaest. Ent.* 12:283-409.
- CASEY, T. L. 1924. Additions to the known Coleoptera of North America, pp. 155-176 *In* Casey, T. L. 1924. *Memoirs of the Coleoptera*, vol. XI. New Era Pub. Co., Lancaster, Pennsylvania. 347 pp.
- CHAPIN, E. A. 1933. A new genus of West Indian Coccinellidae (Coleoptera). *Proc. Biol. Soc. Washington* 45:95-100.
- _____. 1955. Name changes in Coccinellidae. *Psyche* 62:87-88.
- GORDON, R. D. 1970. The genus *Zagloba* in Central and South America (Coleoptera: Coccinellidae). *Proc. Ent. Soc. Washington* 72:479-484.
- _____. 1971a. A revision of the genus *Zenoria* Mulsant (Coleoptera: Coccinellidae). *Smithsonian Cont. Zool.* 86:1-22.
- _____. 1971b. A generic review of the Cryptognathini, new tribe, with a description of a new genus (Coleoptera: Coccinellidae). *Acta Zool. Lilloana* 26:181-196.
- _____. 1972. A review of the genus *Nephaspis* Casey and a comparison with the genus *Clitostethus* Weise (Coleoptera: Coccinellidae). *Rev. Agr. Piracicaba* 47:145-154.
- _____. 1976. The Scymnini (Coleoptera: Coccinellidae) of the United States and Canada: Key to genera and revision of *Scymnus*, *Nephus* and *Diomus*. *Bull. Buffalo Soc. Nat. Sci.* 28:1-362.
- _____. 1977. Classification and phylogeny of the New World Sticholotidinae (Coccinellidae). *Coleopterists Bull.* 31:185-228.
- _____. AND D. M. ANDERSON. The genus *Stethorus* Weise (Coleoptera: Coccinellidae) in Chile. *Coleopterists Bull.* (in press).
- SICARD, A. 1929. Description d'espèces nouvelles de Coccinellidae. *Ann. Mag. Nat. Hist., Ser. 10*, 4:515-524.
- WEISE, J. 1929. Westindische Chrysomeliden und Coccinelliden. *Zool. Jahrb. Suppl.* 16:13-34.



LITERATURE NOTICE

Mezozojskie Zhestkokrylye (Mesozoic Coleoptera), by L. V. Arnoldi, V. V. Zherichin, L. M. Nikritin, and A. G. Ponomarenko. *Trudy Paleontologicheskogo Instituta, Akademiia Nauk SSSR*, 161:1-204, illus.

Descriptions and illustrations of 111 species, 64 genera, and 19 families, including many new taxa, of which 4 families are new (Triaplidae, Parahygrobiidae, Liadytidae, Eobelidae). In Russian.